S-PA Pre-Algebra Session 14 7/20

36, 48

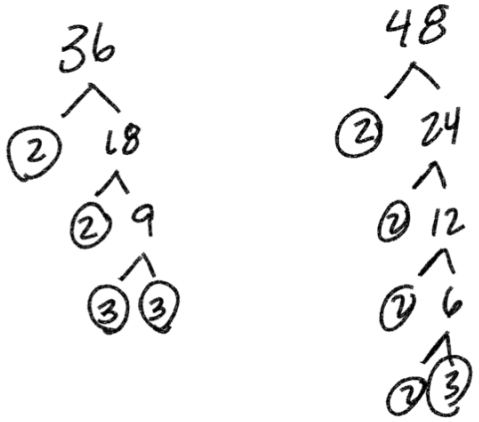
1.) Prime Factorize ✓

2.) GCF

3.) LCM

4.) Reduce $\frac{36}{48}$

1.)



36: 3·3·2·2

48: 3·2·2·2·2

2.) GCF

36: 3·3·2·2

48: 3·2·2·2·2

take pairs
multiply one of each

GCF: 3·2·2 = 12

3.) LCM

36: 3·3·2·2

48: 3·2·2·2·2

take pairs
Thanos - delete one of each

LCM: 3*48 = 144

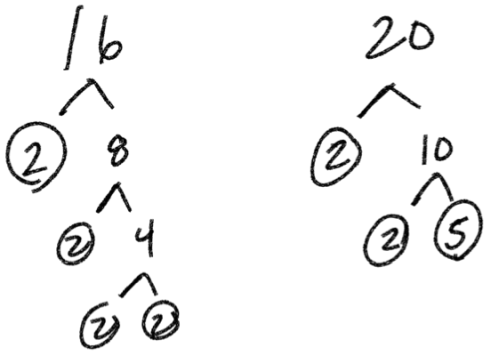
4.) Reduce $\frac{36}{48} = \frac{3\cdot3\cdot2\cdot2}{3\cdot2\cdot2\cdot2\cdot2}$

take pairs
Kill them all — multiply survivors

$\frac{3}{4}$

$20x^5y^3$, $16x^3y^8$

1.) Factorize coefficients



2.) GCF

3.) Reduce $\dfrac{16x^3y^8}{20x^5y^3}$

$16: 2\cdot2\cdot2\cdot2$

$20: 5\cdot2\cdot2$

2.) GCF $16x^3y^8$, $20x^5y^3$

$2\cdot2\cdot2\cdot2\cdot x^3\cdot y^8$

$5\cdot2\cdot2\cdot x^5\cdot y^3$

Look for the smallest exponent on each variable

GCF: $2\cdot2\cdot x^3y^3 = \boxed{4x^3y^3}$

3. Reduce $\dfrac{16x^3y^8}{20x^5y^3} = \dfrac{2\cdot2\cdot2\cdot2\cdot x^3\cdot y^8}{5\cdot2\cdot2\cdot x^5\cdot y^3} = \boxed{\dfrac{4y^5}{5x^2}}$

$\dfrac{x\cdot x\cdot x}{x\cdot x\cdot x\cdot x\cdot x} = \dfrac{x^3}{x^5} = x^{3-5} = x^{-2} = \dfrac{1}{x^2}$

$\dfrac{y^{\boxed{8}}}{y^3} = y^{8-3} = y^5$

$$8a^3b^4c^5 * 4a^7bc^4 = 32a^{10}b^5c^9$$

$8*4 = 32$

$a^3 * a^7 = a^{3+7} = a^{10}$

$b^4 * b^{(1)} = b^{4+1} = b^5$

$c^5 * c^4 = c^{5+4} = c^9$

Multiply exponents, with the same base, you add them.

Reduce

$$\frac{18a^3b^7c}{3ab^4c^3} = \frac{6a^2b^3}{c^2}$$

$\frac{18}{3} = 6$

$\frac{a^3}{a} = a^{3-1} = a^2$

$\frac{b^7}{b^4} = b^{7-4} = b^3$

$\frac{c}{c^3} = c^{1-3} = c^{-2} = \frac{1}{c^2}$

Divide exponent, with the same base, you subtract them.

$$\frac{2a^3b^4 * 6a^4b^8c}{3ab^5c^3} = \frac{12a^{3+4}b^{4+8}c}{3ab^5c^3}$$

$$\frac{12a^7b^{12}c}{3ab^5c^3} = \boxed{\frac{4a^6b^7}{c^2}}$$

$$\frac{a^7}{a} = a^{7-1} = a^6 \qquad \frac{b^{12}}{b^5} = b^{12-5} = b^7$$

$$\frac{c}{c^3} = c^{1-3} = c^{-2} = \frac{1}{c^2}$$

$$3^0 = 1 \qquad -2^0 = 1 \qquad x^0 = 1 \qquad \left(c^3\right)^0 = 1$$

$$6^{-2} = \frac{1}{6^2} = \frac{1}{36} \qquad a^{-4} = \frac{1}{a^4}$$

$$\left(2a^3b^5\right)^3 = 2^{1*3}\, a^{3*3}\, b^{5*3}$$

$$2^3a^9b^{15} = \boxed{8a^9b^{15}}$$

$(4a^7b^3)^2 = 4^{2}\ a^{7*2}\ b^{3*2}$

$4^2 a^9 b^5 = \boxed{16a^9b^5}$

$(4a * 8a^3)^2$

$(32a^4)^2$

$a = 5 \quad b = 2$

PEMDAS... order of operations

$\frac{4a^2}{b^3} = \frac{4(5)^2}{(2)^3} = \frac{4(25)}{8} = \frac{1(25)}{2} = \boxed{\frac{25}{2}}$

$4x^2y^3 \quad x = 1 \quad y = 2$

$4(1)^2(2)^3 = 4 \cdot 1 \cdot 8 = \boxed{32}$

$1^2 = 1 \cdot 1 = 1$

$2^3 = 2 \cdot 2 \cdot 2$

$8^3 = 8 \cdot 8 \cdot 8 = 512$

$\frac{8a^2b^3}{c} \quad a = 4 \quad b = 2 \quad c = 32$

$\frac{8(4)^2(2)^3}{32} = \frac{8 \cdot 16 \cdot 8}{32} = \frac{8 \cdot 1 \cdot 8}{2} = \frac{4 \cdot 1 \cdot 8}{1}$

$\boxed{32}$

Scientific Notation

$84{,}000{,}00\overset{6\,5\,4\,3\,2\,1}{0.} = \boxed{8.4 * 10^{6}}$

$3{,}050{,}000. = 3.05 * 10^{6}$

$28{,}100{,}000{,}000. = 2.81 * 10^{10}$

10

$7048. = 7.048 * 10^{3}$

3

$3 + 1 = 4$

$0.0008\,93 = 8.93 * 10^{-4}$

4

$0.00000\,3781 = 3.781 * 10^{-6}$

6

leading zeros

$5 + 1 = 6$

$0.0000450 = 4.5 * 10^{-5}$

1 2 3 4 5

4 + 1 = 5

$1.43 * 10^{8} = 143000000$

+ →

$2.8911 * 10^{-3} = 0.0028911$

← −

$(2 * 10^{4})(6 * 10^{3})$

$12 * 10^{4+3} = 12 * 10^{7}$

7 + 1

$12 * 10^{7}$

$1.2 * 10^{8}$

But... scientific notation has only one digit before the decimal